

IN THE CLAIMS

Please amend the claims as follows.

1 1. (Currently amended) An apparatus comprising:
2 at least one processor;
3 a memory coupled to the at least one processor;
4 a network interface that couples the apparatus to a network that is coupled to a
5 plurality of other computer systems and wherein the apparatus and the plurality of other
6 computer systems form a cluster of computers that cooperate via ordered messages to
7 perform a task; and
8 a cluster communication mechanism residing in the memory and executed by the
9 at least one processor, the cluster communication mechanism including a sliding send
10 window that communicates at least one ordered message to a plurality of the other
11 computer systems without waiting for an acknowledge message from any of the plurality
12 of other computer systems before sending out the next ordered message, and wherein
13 each ordered message includes a header with information that indicates whether an
14 acknowledge message for the ordered messages may be delayed and grouped with at least
15 one subsequent acknowledge message, and the cluster communication mechanism
16 enforces execution order of a plurality of received messages to perform the task in the
17 order the plurality of received messages were received.

1 2. (Currently amended) The apparatus of claim 1 wherein the cluster communication
2 mechanism sends a null message forcing acknowledges to pending messages to be sent by
3 the plurality of other computer systems when the cluster communication mechanism
4 changes to a new destination for sending subsequent messages ~~each ordered message~~
5 ~~includes a header with information that indicates whether an acknowledge message for~~
6 ~~the ordered messages may be delayed and grouped with at least one subsequent~~
7 ~~acknowledge message.~~

1 3. (Currently amended) The apparatus of claim 2 wherein at least one of the plurality of
2 other computers includes a message timer to determine to send an acknowledge without
3 waiting to send a group acknowledge when the header indicates that an acknowledge
4 message can be delayed and grouped with at least one subsequent acknowledge message
5 ~~wherein the acknowledge message acknowledges from one to a plurality of ordered~~
6 ~~messages.~~

1 4. (Currently amended) A networked computer system comprising:
2 a cluster of computer systems that cooperate via ordered messages to perform a
3 task wherein each computer system includes:
4 a network interface that couples each computer system via a network to
5 other computer systems in the cluster;
6 a memory; and
7 a cluster communication mechanism residing in the memory, the cluster
8 communication mechanism enforcing execution order of a plurality of received
9 messages to perform the task in the order the plurality of received messages were
10 ~~received~~, the cluster communication mechanism including a sliding send window
11 that communicates at least one ordered message to a plurality of other computer
12 systems without waiting for an acknowledgment from any of the plurality of other
13 computer systems before sending out the next ordered message;
14 wherein each ordered message includes a header with information that
15 indicates whether an acknowledge message for the ordered messages may be
16 delayed and grouped with at least one subsequent acknowledge message, and
17 wherein at least one of the plurality of other computers includes a message timer
18 to determine to send an acknowledge without waiting to send a group
19 acknowledge when the header indicates that an acknowledge message can be
20 delayed and grouped with the at least one subsequent acknowledge message.

1 5. (Currently amended) The networked computer system of claim 4 wherein the cluster
2 communication mechanism sends a null message forcing acknowledges to pending
3 messages to be sent by the plurality of other computer systems when the cluster
4 communication mechanism changes to a new destination for sending subsequent
5 messages ~~each ordered message includes a header with information that indicates whether~~
6 ~~an acknowledge message for the ordered messages may be delayed and grouped with at~~
7 ~~least one subsequent acknowledge message.~~

1 6. (Currently amended) A computer-implemented method for processing a task in a
2 clustered computing environment, the method comprising the steps of:
3 providing a cluster communication mechanism executing on a first computer
4 system in a cluster wherein the computers in the cluster cooperate via ordered messages
5 to perform the task and wherein the cluster communications mechanism includes a sliding
6 send window that communicates at least one ordered message to a plurality of other
7 computer systems in the cluster without waiting for an acknowledgment from each
8 computer system in the cluster that received an ordered message before sending out the
9 next ordered message, and wherein the cluster communication mechanism enforces
10 execution order of a plurality of received messages ~~in the order the plurality of received~~
11 ~~messages were received~~ to perform the task;
12 the cluster communication mechanism sending a first ordered message to a first
13 plurality of other computer systems in the cluster; and
14 the cluster communication mechanism sending a second ordered message to a
15 second plurality of other computer systems in the cluster without waiting for a response to
16 the first ordered message from each of the first plurality of other computer systems in the
17 cluster.

1 7. (Previously Presented) The method of claim 6 further comprising the step of at least
2 one of the first plurality of other computer systems in the cluster responding to the first
3 and second ordered messages by sending a single acknowledge message to the cluster
4 communication mechanism that acknowledges both the first and second ordered
5 messages.

1 8. (Original) The method of claim 6 wherein the first and second ordered messages each
2 include a header with information that indicates whether an acknowledge message for the
3 first and second ordered messages may be delayed and grouped with at least one
4 subsequent acknowledge message.

1 9. (Currently Amended) A program product comprising:
2 (A) a computer program comprising:
3 (A1) a cluster communication mechanism that includes a sliding send
4 window that communicates at least one ordered message to a plurality of other
5 computer systems in a cluster computer system that cooperate via ordered
6 messages to perform a task without waiting for an acknowledgment from any of
7 the plurality of other computer systems before sending out the next ordered
8 message, and wherein the cluster communication mechanism enforces execution
9 of a plurality of received messages to perform the task in the order the plurality of
10 ~~received messages were received~~; and
11 (B) recordable ~~computer-readable tangible~~ signal bearing media bearing the
12 computer program.

1 10. (Cancelled)

1 11. (Cancelled)

1 12. (Original) The program product of claim 9 wherein each ordered message includes a
2 header with information that indicates whether an acknowledge message for the ordered
3 messages may be delayed and grouped with at least one subsequent acknowledge
4 message.

1 13. (Previously Presented) The apparatus of claim 1 wherein the cluster communication
2 mechanism communicates the at least one ordered message to the plurality of other
3 computer systems via IP multicast.

1 14. (Cancelled)

1 15. (Previously Presented) The method of claim 6 wherein first plurality of computer
2 systems includes all computer systems in the second plurality of computer systems.

1 16. (Previously Presented) The method of claim 6 wherein the first plurality of computer
2 system comprises the second plurality of computer systems.

1 17. (Previously Presented) The method of claim 6 wherein the cluster communication
2 mechanism communicates the at least one ordered message to the plurality of other
3 computer systems via IP multicast.

1 18. (Cancelled)

1 19. (Previously Presented) The program product of claim 9 wherein the cluster
2 communication mechanism communicates the at least one ordered message to the
3 plurality of other computer systems via IP multicast.

1 20. (Cancelled)

Please add the following new claims:

1 21. (New) The method of claim 6 wherein the cluster communication mechanism sends a
2 null message forcing acknowledges to pending messages to be sent by the plurality of
3 other computer systems when the cluster communication mechanism changes to a new
4 destination for sending subsequent messages.

1 22. (New) The method of claim 21 wherein at least one of the plurality of other
2 computers includes a message timer to determine to send an acknowledge without
3 waiting to send a group acknowledge when the header indicates that an acknowledge
4 message can be delayed and grouped with at least one subsequent acknowledge message.

1 23. (New) The program product of claim 9 wherein the cluster communication
2 mechanism sends a null message forcing acknowledges to pending messages to be sent by
3 the plurality of other computer systems when the cluster communication mechanism
4 changes to a new destination for sending subsequent messages.

1 24. (New) The program product of claim 23 wherein at least one of the plurality of other
2 computers includes a message timer to determine to send an acknowledge without
3 waiting to send a group acknowledge when the header indicates that an acknowledge
4 message can be delayed and grouped with at least one subsequent acknowledge message.